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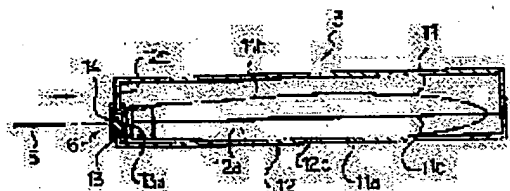
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(54) INK VESSEL

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink vessel for an ink-jet printer which enables consumption of ink without waste until the ink remains little, irrespective of a mount direction of an ink pack.

SOLUTION: One side face 11a of an ink pack 11 is bonded to a flat face 12a of a second supporting part 12c of a cartridge case 12. The one side face 11a is maintained flat even when ink is consumed. In consequence, the other side face 11b of the ink pack 11 becomes gradually close to the one side face 11a in accordance with the consumption of ink, and the ink in the ink pack can be consumed to be hardly left.



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CLAIMS

[Claim(s)]

[Claim 1] Said ink container used for an ink jet printer equipped with an ink container applied part which has an ink supply pipe of the shape of a hollow needle combined with said ink container in order to lead ink in a print head which is characterized by providing the following, and which prints by breathing out ink to a record medium, an ink container which stores ink supplied to this print head, and this ink container to a print head. An ink pack which stores ink in the interior while having the ink feed-holes section which was formed in sealing saccate with a flexible resin material, and was blockaded in a rubber member a flat field -- having -- this -- supporter material by which about 30% or more of portion of the side of said ink pack is attached in a flat field at deformation impossible.

[Claim 2] Said supporter material is an ink container according to claim 1 with which said ink feed-holes section has the 1st supporter by which attachment support is carried out, and the 2nd supporter which is formed successively by this 1st supporter and has said flat field.

[Claim 3] A portion of the side attached in a flat supporter material [said] field at deformation impossible is an ink container according to claim 1 or 2 which is the portion which contacts when an ink pack with which ink was stored is laid in a flat supporter material [which was held at a level condition or a vertical condition] field.

[Claim 4] A portion of the side which installation of an ink pack to a flat supporter material [said] field is made by adhesion, and is attached in said deformation impossible is an ink container containing a portion surrounded or pinched in a portion by which adhesion immobilization is carried out according to claim 1 to 3.

[Claim 5] A portion of the side of an ink pack attached in a flat supporter material [said] field at deformation impossible is an ink container according to claim 1 to 4 which is about 60% or more.

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DETAILED DESCRIPTION

Detailed Description of the Invention]

[0001]

The technical field to which invention belongs] This invention relates to the ink container used for an ink jet printer.

[0002]

[Description of the Prior Art] Conventionally, the ink in an ink container is led to a print head, the ink jet recording device which breathes out and records ink toward a record medium by driving two or more nozzles prepared in this print head according to a record pattern signal is known, and this ink jet recording device is adopted as the printer sections, such as an output unit of electronic equipment, and facsimile.

[0003] As such an ink jet recording device, the hollow needle to which the ink supply pipe which results in a print head at a container applied part was connected is fixed, and the thing in which ink output port was formed is known by piercing the container receiving window section of an ink container with this hollow needle at the time of wearing of an ink container so that it may be indicated by JP,57-34967,A and JP,63-281849,A.

[0004] This ink container held the ink pack formed in sealing saccate with the sheet-like resin material which has flexibility in support casing with rigidity, and has equipped the ink feed-holes section of an ink pack with the rubber stopper which pierces a hollow needle.

[0005]

[Problem(s) to be Solved by the Invention] By the way, in such an ink jet recording device, although the sense of installation of an ink pack will change with postures of the ink container with which said container applied part is equipped although the mode of the container applied part equipped with an ink container is considered variously, when the sense of installation of the ink pack differs, the technical problem that the amount of the ink used which can finally be used changes a lot occurs. Therefore, if it is going to enlarge the amount of the ink used, the mode of the container applied part equipped with an ink container will be restricted.

[0006] As shown in drawing 8 (a) - (c), namely, the sense of installation of the ink pack 101 The upward condition that the ink feed-holes section 102 serves as facing up, the sideways length condition that the ink feed-holes section 102 serves as sideways, and becomes thin in the cross direction, And when the ink feed-holes section 102 considers as the sideways level condition which serves as sideways and becomes thin in the height direction and consumes ink in each condition, as shown in drawing 9 (a) - (c), the amount of the ink used which can finally be consumed in each condition changes.

[0007] To the amount of the ink used specifically becoming about 90%, when the ink pack 101 is in a sideways length condition and a sideways level condition, in being in a upward condition, the amount of the ink used becomes 80% (in the case of 0% of adhesion area of the below-mentioned table 1, see). When the ink feed-holes section 102 is made into a upward condition, the amount of the ink which can finally be used compared with the case where it considers as a sideways length condition and a sideways level condition decreases, and the amount of survival of ink increases as a result. This is considered to be because for any regulation not to have deformation of the ink pack 101 accompanying consumption of ink and it to be performed freely.

[0008] This invention aims at offering the ink container for ink jet printers which can consume ink without futility until it was made in view of this point and its amount of survival of ink decreases irrespective of the sense of installation of an ink pack.

[0009]

[Means for Solving the Problem] A print head which prints by invention of claim 1 breathing out ink to a record medium, An ink container which stores ink supplied to this print head, It is a thing on condition of said ink container used for an ink jet printer equipped with an ink container applied part which has an ink supply pipe of the shape of a

hollow needle combined with said ink container in order to lead ink in this ink container to a print head. An ink pack which stores ink in the interior while having the ink feed-holes section which was formed in sealing saccate with a flexible resin material, and was blockaded in a rubber member, a flat field -- having -- this -- it has supporter material by which about 30% or more of portion of the side of said ink pack is attached in a flat field at deformation impossible.

[0010] From about 30% or more of portion of the side of an ink pack which stores ink being attached in the interior to a flat supporter material field at deformation impossible according to invention of claim 1 Ink is consumed without futility until it comes to approach gradually a side [in which the side of a side which is not attached is attached in deformation impossible] side in connection with ink being consumed and the amount of survival of ink decreases irrespective of sense of installation of an ink pack. Therefore, the big amount of the ink used is secured, without receiving limit of a mode of a container applied part of being equipped with an ink container.

[0011] Invention of claim 2 has the 2nd supporter with which said ink feed-holes sections are formed successively by the 1st supporter with which attachment support is carried out, and this 1st supporter, and said supporter material has said flat field in an ink container of claim 1.

[0012] According to invention of claim 2, attachment support of the ink feed-holes section is carried out at the 1st supporter of supporter material, the side of an ink pack is attached in a flat supporter [which is formed successively by this 1st supporter / 2nd] field at deformation impossible, and an ink pack is supported by supporter material with easy structure.

[0013] Invention of claim 3 is a portion which contacts when an ink pack with which ink was stored is laid in a flat supporter material field where a portion of the side attached in a flat supporter material [said] field at deformation impossible was held at a level condition or a vertical condition in claim 1 or an ink container of 2.

[0014] according to invention of claim 3, a portion which contacts when an ink pack with which ink was stored is laid in a flat supporter material [which was held at a level condition or a vertical condition] field attaches in deformation impossible -- having -- an ink pack with large effect to consumption of ink -- a part for a center section is mostly attached in deformation impossible simply.

[0015] A portion of the side in which installation of an ink pack to a flat supporter material [said] field is made by adhesion, and invention of claim 4 is attached in said deformation impossible in one ink container of claims 1-3 contains a portion surrounded or pinched in a portion by which adhesion immobilization is carried out.

[0016] According to invention of claim 4, adhesion immobilization also of the portion surrounded or pinched in a portion by which adhesion immobilization is carried out will be carried out to a flat field like a portion by which adhesion immobilization is carried out.

[0017] A portion of the side of an ink pack in which invention of claim 5 is attached in a flat supporter material [said] field in one ink container of claims 1-4 at deformation impossible is about 60% or more.

[0018] According to invention of claim 5, the amount of the ink used becomes close to about 100%, and can use most ink in an ink pack.

[0019]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained along with a drawing.

[0020] In drawing 1 which shows the outline configuration of the ink jet recording device concerning this invention, the ink jet recording device 1 is equipped with the print head 2 which records on a record medium (not shown) by breathing out ink, and ink is supplied to this print head 2 from the ink cartridge 3 as an ink container which stores ink. said print head 2 -- the cross direction of a record medium -- a round trip -- it is carried on the carriage (not shown) formed movable, and the cartridge applied part 4 by which it is equipped with said ink cartridge 3 removable on this carriage is formed.

[0021] Said cartridge applied part 4 has wall section 4a, and the hollow needle-like connection material 5 is formed in this wall section 4a. The ink feed-holes section 6 of an ink cartridge 3 is penetrated, it is combined with said ink cartridge 3, and said connection material 5 leads the ink in said ink cartridge 3 to a print head 2 through the ink supply pipe 7 by the association, in case the cartridge applied part 4 is equipped with said ink cartridge 3 removable.

[0022] Moreover, as for said ink cartridge 3, it is constituted and the ink pack 11 with which ink is stored inside specifically becomes so that may be contained in a cartridge case 12, as shown in drawing 2 and drawing 3, and said ink feed-holes section 6 is connected to the ink pack 11. The ink feed-holes section 6 is constituted by the fixture 13 which attachment immobilization is carried out at a cartridge case 12, and has feed-hole 13a, and the rubber member 14 which consists of a rubber material and blockades feed-hole 13a of said fixture 13. in addition, said rubber member 14 -- said connection material 5 -- poking -- ***** -- he is things and is trying for penetration to become possible

[0023] The sheet-like resin material with which said saccate ink pack 11 has flexibility is bent. Joining of the circumference portion except the edge in which a fixture 13 will be attached in and the ink feed-holes section 6 will be

located is carried out. It is formed in the sealing saccate which has two sides 11a and 11b which counter, reinforcement becomes high in circumference partial 11c of the shape of a typeface of the KO by which joining was carried out, and it has been hard coming to deform from other portions.

[0024] Moreover, it has pasted up along with flat field 12a about 30% or more of whose portion of one side 11a of said ink pack 11 is the internal surface of the cartridge case 12 which functions as supporter material. Therefore, the portion pasted up among said side 11a will be attached in flat field 12a at deformation impossible. Here, it means that a ratio when "the portion to paste up is 30% or more" makes 100% the portion which contacts when the ink pack 11 with which the full reservoir of the ink was carried out is laid in flat field 12a of the cartridge case 12 held at the level condition or the vertical condition is 30% or more.

[0025] 1st supporter 12b by which, as for said cartridge case 12, attachment support of the ink feed-holes section 6 is carried out -- this -- it has 2nd supporter 12c which is formed successively in the direction which intersects perpendicularly with 1st supporter 12b, and has said flat field 12a, and considers as the shape of a cube type.

[0026] Moreover, the side 11a portion of the ink pack 11 by which adhesion immobilization is carried out at said flat field 12a is a portion which contacts when the ink pack 11 with which the full reservoir of the ink was carried out is laid in flat field 12a of the ink cartridge 12 held at the level condition or the vertical condition, and he is trying for the force with the ink pack 11 impossible for not to act by the adhesion immobilization.

[0027] About 30% or more of portion of one side 11a of the ink pack 11 thus, by pasting flat field 12a of a cartridge case 12 Irrespective of the installation condition (therefore sense of installation of the ink pack 11) to the cartridge applied part 4 of an ink cartridge 3 Similarly, with consumption of ink, side 11b of another side approaches one side 11a gradually, and it comes to be consumed until the residue of internal ink decreases.

[0028] In addition, as a means attached in the deformation impossible mentioned above, the adhesion immobilization using a double-sided tape besides using the adhesives mentioned above adhesion immobilization etc. is employable, and it is sufficient if it is the means which can be attached in deformation impossible along with flat field 12a. Moreover, as for the area of the portion by which adhesion immobilization is carried out from a viewpoint it is made for the residue of ink to hardly produce by considering the amount of the ink used as 100% of abbreviation, it is more desirable to consider as about 60% or more.

[0029] At the time of wearing of an ink cartridge 3, if constituted as mentioned above, as shown in drawing 2 , by equipping the cartridge applied part 4 with an ink cartridge 3 removable, the connection material 5 can be pierced in the rubber member 14 of the ink feed-holes section 6, and it will penetrate, and will consider as the condition in which ink supply is possible.

[0030] And since one side 11a of said ink pack 11 pastes flat supporter 12c [of a cartridge case 12 / 2nd] field 12a and has become deformation impossible, even if ink is consumed, the deformation accompanying it is regulated, and one side 11a does not deform, but maintains a flat condition.

[0031] Consequently, irrespective of the installation condition (therefore sense of installation of the ink pack 11) to the cartridge applied part 4 of an ink cartridge 3, similarly, with consumption of ink, it displaces so that side 11b of another side of the ink pack 11 may approach one side 11a gradually, and it is consumed until the residue of ink decreases among the both-sides sides 11a and 11b. Therefore, the big amount of the ink used is secured, without receiving limit of the mode of the cartridge applied part 4 of being equipped with an ink cartridge 3.

[0032] Moreover, the ink pack 11 welds circumference partial 11c except the edge in which the ink feed-holes section 6 is formed at this time. It is formed in saccate [which has two sides 11a and 11b which counter], and reinforcement becomes high in the circumference partial 11c by which joining was carried out. Since it has been hard coming to deform from other portions, it comes to promote making it deform so that side 11b of another side may approach one side 11a gradually by adhesion immobilization mentioned above with consumption of ink.

[0033] On the other hand, at the time of balking after ink use, as shown in drawing 3 , the connection material 5 is drawn out from the rubber member 14 by seceding from the cartridge applied part 4 in an ink cartridge 3, and the hole which the connection material 5 penetrated is blocked by the elasticity of the rubber member 14. [0034] Then, the trial which followed the relation between the adhesion area of flat field 12a of a cartridge case 12 and side 11a of the ink pack 11 and the amount of the ink used is explained.

[0035] Using the ink cartridge 3 which requires flat field 12a of said cartridge case 12, and side 11a of the ink pack 11 for this invention by which adhesion immobilization is carried out, as shown in drawing 4 (a) - (c), the sense of installation of the ink pack 11 It considered as the upward condition that the ink feed-holes section 6 serves as facing up, the sideways length condition that the ink feed-holes section 6 serves as sideways, and becomes thin in the cross direction, and the sideways level condition that the ink feed-holes section 6 serves as sideways, and becomes thin in the height direction, and the amount of the ink used was investigated about each condition.

[0036] The condition after use is as being shown in drawing 5 (a) - (c), and a test result is shown in drawing 6 and a table 1. In addition, the adhesion area of flat field 12a of said cartridge case 12, and side 11a of the ink pack 11 To flat field 12a of the cartridge case 12 held at the level condition or the vertical condition The ratio at the time of considering as 100% shows the portion which contacts when the ink pack 11 with which ink was stored is laid, and the ratio at the time of making into 100% the ink currently first stored by the ink pack 11 shows the amount of the ink used. In drawing 6, A, B, and C show 94%, 91%, and 83%, respectively.

[A table 1]

| | | インクパックの接着面積 (%) | | | | |
|-------------------------------|---------|-----------------|----|----|----|--------|
| | | 0 | 15 | 30 | 50 | 60~100 |
| イン 使 ク 用 量 (%) | 上向き状態 | 80 | 83 | 91 | 94 | 97 |
| | 横向き縦状態 | 90 | 91 | 95 | 97 | 98 |
| | 横向き水平状態 | 93 | 94 | 96 | 97 | 98 |

It turns out that the amount of the ink used will increase more than the above-mentioned test result in connection with it if the adhesion area of flat field 12a of a cartridge case 12 and side 11a of the ink pack 11 becomes large even if it is in which condition of a upward condition, a sideways length condition, and a sideways level condition. And if the adhesion area of flat field 12a of a cartridge case 12 and side 11a of the ink pack 11 is about 30% or more, it will be checked the sense of installation of the ink pack 11 or that do not change, but the amount of the ink used becomes 90% or more, and about 60% or more, then the amount of the ink used reach adhesion area to about 100%.

[0037] In the gestalt of operation mentioned above, although he is trying for the adhesion area of flat field 12a and side 11a of the ink pack 11 to become 30% or more of side 11a of the ink pack 11, this invention is not limited to it, and if there is a portion surrounded or pinched in the portion by which adhesion immobilization is carried out, the area of that is also contained. Namely, if there are portions 31, 32, and 33 surrounded or pinched in the portions 21a, 21b, 22a-22c by which adhesion immobilization is carried out, and 23a-23c as shown, for example in drawing 7 (a), (b), and (c) Since it will be in the condition same with the portions 31, 32, and 33 as well as the portions 21a, 21b, 22a-22c by which adhesion immobilization is carried out, and 23a-23c being attached in migration impossible to flat field 12a The same effect will be done so if about 30% or more of portions also including the area of such portions 31, 32, and 33 are migration impossible.

[0038] The ink pack 11 can be used for this invention also with various postures, such as facing down or an inclination condition, irrespective of the gestalt of operation mentioned above. Moreover, flat field 12a which pastes up the ink pack 11 may be the field which curved on the concave curved surface etc. only not only in the perfect plane. Moreover, this invention can be carried out not only in the printer as an output unit of a computer but in the printer sections, such as an output unit of various kinds of electronic equipment, and facsimile.

[0039]

[Effect of the Invention] This invention is carried out with a gestalt which was explained above, and does so an effect which is described below.

[0040] Since invention of claim 1 has attached about 30% or more in the interior as mentioned above at deformation impossible to the flat supporter material field of the side of the ink pack which stores ink It becomes possible to consume ink without futility until it comes to approach gradually a side [in which the side of the side which is not attached is attached in deformation impossible] side in connection with ink being consumed and the amount of survival of ink decreases irrespective of the sense of installation of an ink pack. Therefore, it becomes possible to secure the big amount of the ink used, without receiving limit of the mode of a container applied part of being equipped with an ink container.

[0041] Invention of claim 2 carries out attachment support of the ink feed-holes section at the 1st supporter of supporter material, and since he is trying to fix the side of an ink pack to migration impossible in a flat supporter [which is formed successively by this 1st supporter / 2nd] field, it can support an ink pack to supporter material with easy

structure.

[0042] Since he is trying for invention of claim 3 to attach in deformation impossible the portion which contacts when the ink pack with which ink was stored is laid in a flat supporter material [which was held at the level condition or the vertical condition] field, it can perform the thing which is an ink pack and which is attached in deformation impossible that there is almost no unreasonableness [part / for a center section].

[0043] By using effectively the portion surrounded or pinched in the portion by which adhesion immobilization is carried out, since it becomes impossible to a flat field also deforming the portion surrounded or pinched in the portion by which adhesion immobilization is carried out like the portion by which adhesion immobilization is carried out, it is little adhesion area and invention of claim 4 can obtain as same the effect as having pasted all up.

[0044] Since he is trying for invention of claim 5 to attach about 60% or more of portion of the side of an ink pack in a flat supporter material field at deformation impossible, the amount of the ink used becomes about 100% in near, and it can use most ink and becomes possible [using ink without futility].

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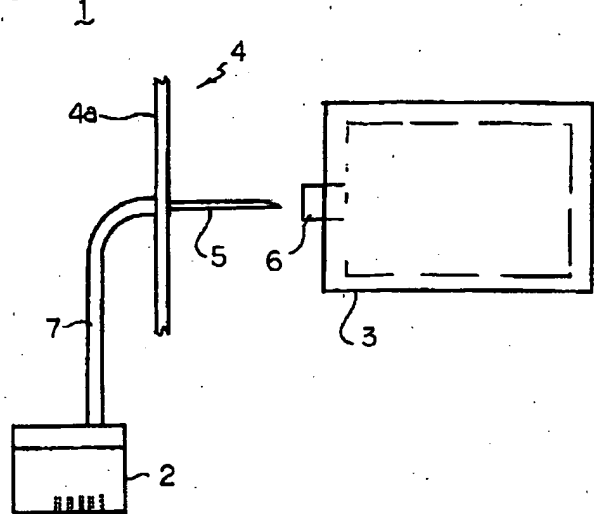
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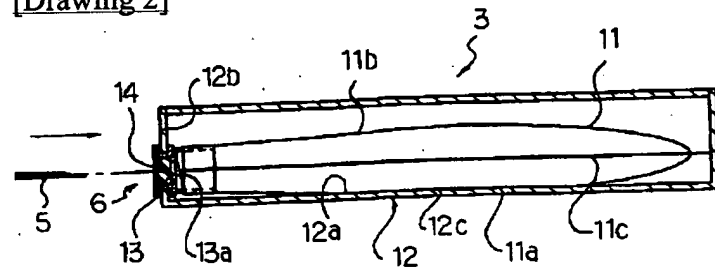
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DRAWINGS

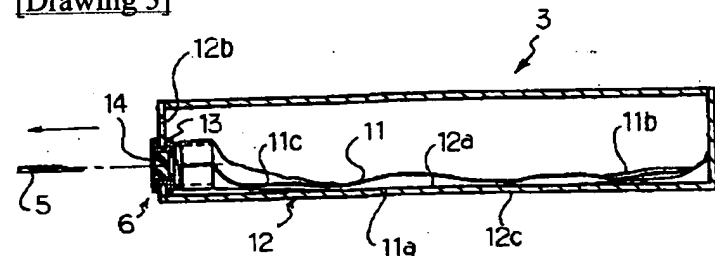
[Drawing 1]



[Drawing 2]

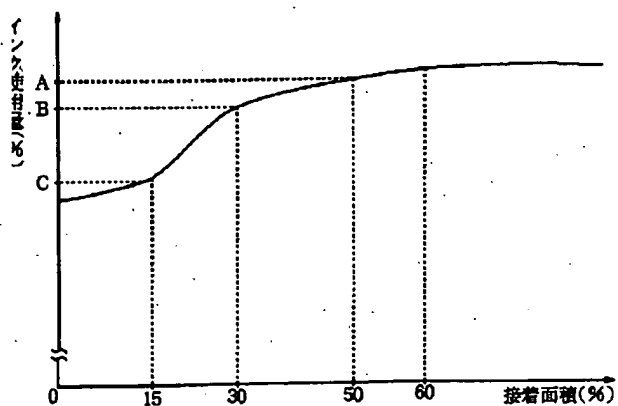


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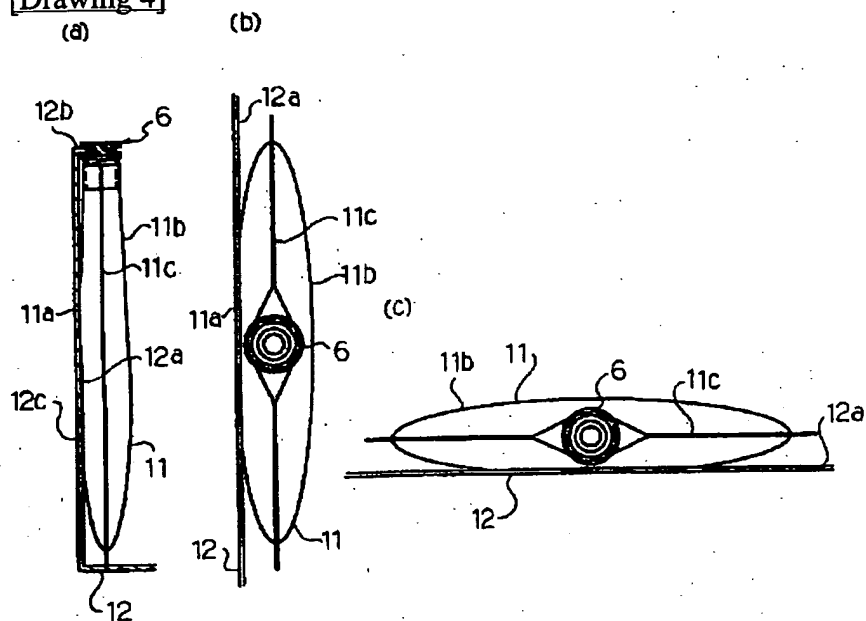


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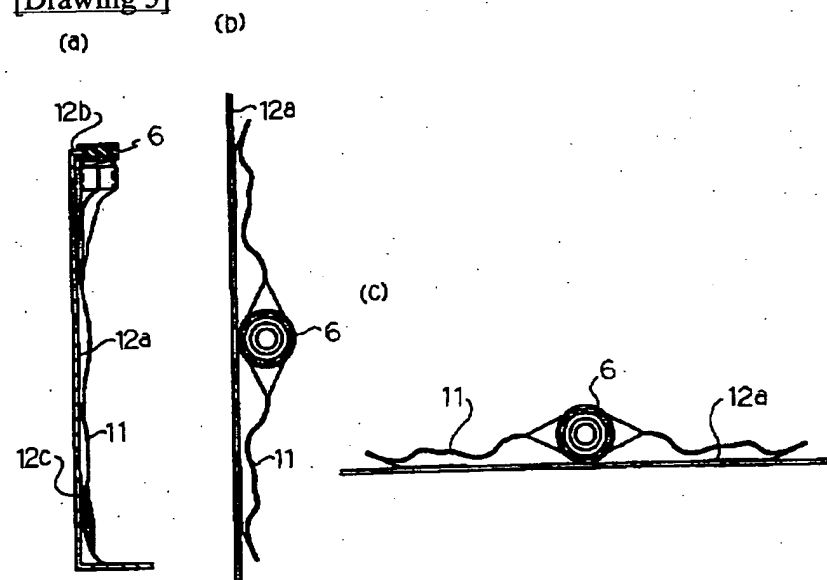
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[Drawing 4]

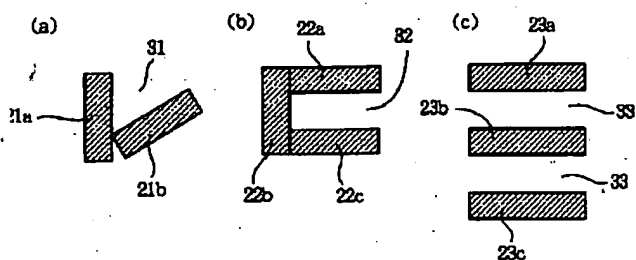


[Drawing 5]

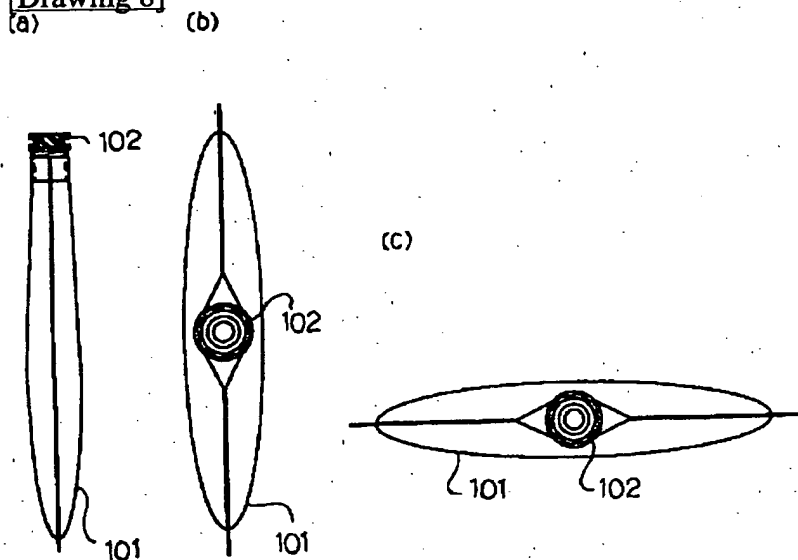


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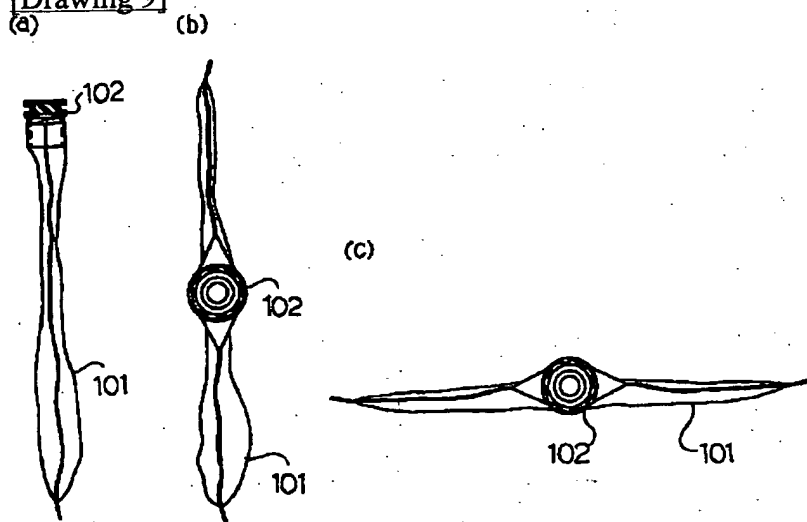
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[Drawing 8]



[Drawing 9]



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